REMARKS

The Examiner will note that the Abstract has been rewritten to provide additional details.

The informalities in the objected-to claims have been corrected, either in the claim itself or the claim into which the objected-to claim has been incorporated.

The Examiner will also note that claims 1 and 19 now specify that the dewaxing catalyst is ZSM-48 containing at least one of Pt or Pd as metal. Claims 3, 4, 11, 20, 21, and 26 are accordingly canceled without prejudice. The acidity of the hydrotreated catalyst is now quantified in claims 1 and 19 by incorporating claims 16 and 30, which are now canceled without prejudice, and claim 31 is also incorporated into claim 19. A hydrofinishing step is added to claim 1 by incorporating claims 6 and 8 into claim 1. Claims 6 and 8 are canceled without prejudice. Claims 23 and 27 are incorporated into claim 19 and are canceled without prejudice. The identity of the hydrofinishing catalyst as MCM-41 is supported on page 18, paragraph 34.

The Examiner's Rejection

Claims 1-7, 9-11, 13-22, and 24-31 were rejected under 35 U.S.C. 103(a) as being unpatentable over Xiao et al. (U.S. 6,264,826). The Examiner expressed the view that the Xiao reference discloses a process for preparing a lubricating base oil. The process comprises solvent extracting a feed that may have a 10% distillation point as claimed in a mild solvent extraction step. The Examiner interprets this disclosure of a mild solvent extracitng step as a step in which the feed is under extracted as claimed in claims 1 and 19 to produce an aromatics-lean raffinate with the claimed properties. The solvent is removed from the raffinate and a base stock having a viscosity index of at least 80 is obtained. The raffinate is then contacted with a hydrotreating catalyst that comprises a support such as silica and a Group VI or VIII metal to produce a gaseous product and a hydrotreated feedstock. The hydrotreating catalyst is believed to have an acidity value as claimed. Hydrotreating conditions include temperatures ranging from 260°C to 427°C, hydrogen partial pressures of less than 11,000 kPa, hydrogen feed rates of at least 1,000 SCF/bbl, a liquid hourly space velocities ranging from 0.1 to 10 hr^{-1}. There is little, if any, conversion of the feed to lighter products during this hydrotreating step. The gaseous product is separated from the hydrotreated feedstock and the feedstock is then contacted with a hydrodewaxing catalyst at hydrodewaxing conditions. The hydrodewaxing catalyst comprises an intermediate pore molecular sieve such as ZSM-5, ZSM-23, and SAPO-11 and a hydrogenation component such as platinum. This hydrodwaxing catalyst may be reduced prior to use. The hydrodewaxing conditions include temperatures ranging from 204°C to 482°C, pressures ranging from 450 to 20,800 kPa, hydrogen treat rates of 500 to 10,000 SCF/bbl and liquid hourly space velocities ranging from 0.1 to 5 hr^{-1}. The effluent from the hydrodewaxing zone is then contacted with a hydrofinishing catalyst that contains a Group VIII noble metal at hydrofinishing conditions to produce a lubricating oil. The product produced by the disclosed process has a viscosity index ranging from 80 to 120. See column 4, line 30 through column 12, line 48.

The Xiao reference does not disclose stripping to separate gas from the hydrotreated feedstock, does not disclose the use of ZSM-48 in the dewaxing catalyst, and does not disclose that the VI increase from the hydrotreating step is within the range claimed.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Xiao by stripping because none would separate the gas from the liquid by any conventional process.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Xiao by using ZSM-48 in the dewaxing catalyst because members of the ZSM family are disclosed as being effective dewaxing catalysts. Although ZSM-48 is not explicitly disclosed, since it is a member of the disclosed family of effective catalysts, one having ordinary skill in the art would expect that a ZSM-48 catalyst would be an effective dewaxing catalyst in the process of Xiao.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust conditions to achieve a VI increase from the hydrotreating step as claimed because one would adjust conditions in order to maximize the production of desired lube base stocks.

Applicants' Response

With regard to the acidity of the hydrotreating catalyst, Xiao is silent. While the Examiner expresses a belief that the catalyst of Xiao has the claimed acidity, Xiao expressed reliance on the hydrotreating conditions to control the extent of conversion to low boiling hydrotreated products (column 7, lines 24-30). Xiao has no recognition that applicants' claimed acidity value influences the degree of conversion.

The Examiner will note that claims 1 and 19 are now specific to ZSM-48 as hydrodewaxing catalyst. Xiao, as noted by the Examiner, does not disclose ZSM-48 as a dewaxing catalyst. In column 9, line 46 et seq., Xiao discloses many ZSM-type zeolites but does not disclose ZSM-48. Xiao also discloses many nonzeolitic catalysts suitable for dewaxing (column 10, lines 1-27). Applicants have shown in Examples 1-3 that ZSM-48 in combination with an under-extracted raffinate can produce superior yields of basestock having excellent Noack volatility and low temperature properties. Xiao teaches the equivalence of ZSM-family zeolites and does not even mention ZSM-48, which, as shown above, produces superior results.

The Examiner's Position

With regard to the hydrofinishing catalyst now a part of amended claim 1 and claim 19, the Examiner stated as follows:

Claims 8, 12, and 23 were rejected under 35 U.S.C. 103(a) as being unpatentable over Xiao et al. (U.S. 6,264,826 B1) as applied to claims 6 and 19 above, and further in view of Kresge et al. (U.S. 5,837,639).

As discussed above, the Xiao reference does not disclose that the hydrofinishing catalyst is selected from the M41S family.

The Kresge reference discloses that catalysts that contain zeolites from the M41S family (e.g., MCM-41) are effective in hydrofinishing processes. See column 15, line 53 through column 16, line 25.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Xiao by utilizing a zeolite catalyst as disclosed by Kresge in the hydrofinishing step because such catalysts are disclosed as being effective in these types of processes and therefore an effective hydrofinishing step would be expected to result through the use of such a catalyst.

Applicants' Response

On the issue of the hydrofinishing catalyst, Xiao does not, as stated by the Examiner, disclose that the hydrofinishing catalyst is selected from the M41S family. The hydrogenation catalyst of Xiao comprises one or more noble metals on an inorganic oxide support (column 11, lines 44-47). These materials are typically amorphous. Xiao specifically teaches that the hydrogenation catalyst is macroporous (column 12, lines 11-39). By macroporous is meant a catalyst having a relatively large amount of pore volume, i.e., at least 1% of pores of diameter greater than about 1000 Angstroms with a minimum macropore volume preferably being greater than 0.07 cm^3/g.

By way of contrast, Kresge discloses crystalline materials, which are mesoporous (column 6, lines 42-57). The term "mesoporous" is used to indicate crystals having uniform pores within the range from about 13 Angstroms to about 200 Angstroms. What would then motivate one skilled in the art to combine

Kresge with Xiao, since the catalysts of Kresge are outside the teachings of Xiao. If anything, Xiao teaches away from a combination with Kresge.

For the reasons noted above and in view of the amended claims, it is urged that applicants have made a patentable advance in the art. Favorable action is solicited.

Respectfully submitted:

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